CLAIMS

1. An optical modulator, comprising:

a substrate having the electro-optical effect;

an optical waveguide and ground ~~waveguide~~s electrodes formed on said substrate; and Feb. 25. '04 M.D.

a traveling wave electrode formed on said substrate including a first region to input an externally applied electrical signal, a second region to control the light propagated through said optical waveguide with an electric field generated between said ground electrodes due to said applied electrical signal, and a third region provided at the intermediate region between said first region and said second region to propagate said electrical signal to said second region without any reflection.

2. The optical modulator according to claim 1, wherein the length

of said third region of said traveling wave electrode is sufficient to shift the phase of the signal element of said electrical signal as much as $\pi/2$.

3. The optical modulator according to claim 1, wherein the impedance of said third region of said traveling wave electrode is equal to the geometric mean of the impedance of said first region and the impedance of said second region of said traveling wave electrode.

4. The optical modulator according to claim 1, wherein an interval between said traveling wave electrode in said third region and said ground electrodes is wider than the interval between said traveling wave electrode in said second region and said ground electrodes.

5. The optical modulator according to claim 1, wherein the width of said traveling wave electrode in said second region is wider than the width of said traveling wave electrode in said third region.

6. The optical modulator according to claim 1, wherein said

traveling wave electrode in said second region is thicker than said traveling wave electrode in said third region.

7. An optical waveguide, comprising:

a substrate having the electro-optical effect;

an optical waveguide and ground electrodes formed on said substrate; and

a traveling wave electrode formed on said substrate including a first region to input an externally applied electrical signal, a second region to control the light propagated through said optical waveguide with an electric field generated with said applied electrical signal between said ground electrodes, and a third region provided at the intermediate region between said first region and second region,

wherein an impedance for said electrical signal of said third region is equal to an intermediate value between the impedance for said electrical

signal of said first region and the impedance for said electrical signal of said second region.

8. The optical modulator according to claim 7, wherein the length of said third region of said traveling wave electrode is sufficient to shift the phase of the signal element of said electrical signal as much as $\pi/2$.

9. The optical modulator according to claim 7, wherein the impedance of said third region of said traveling wave electrode is equal to the geometric mean of the impedance of said first region and the impedance of said second region of said traveling wave electrode.

10. The optical modulator according to claim 7, wherein an interval between said traveling wave electrode in said third region and said ground electrodes is wider than the interval between said traveling wave electrode in said second region and said ground electrodes.

11. The optical modulator according to claim 7, wherein the width of

said traveling wave electrode in said second region is wider than the width of said traveling wave electrode in said third region.

12. The optical modulator according to claim 7, wherein said traveling wave electrode in said second region is thicker than said traveling wave electrode in said third region.